Attorney's Docket No.:07977/017002

In the claims:

1. (Currently Amended) A method of manufacturing a semiconductor device comprising the steps of:

forming a crystalline semiconductor film on an insulating surface;

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forming an insulating film on said crystalline semiconductor film;

introducing a dopant impurity into said crystalline semiconductor film through said insulating film by an ion doping ~~without mass separation; and~~

annealing said crystalline semiconductor film~~,~~; and

forming a gate electrode over said insulating film,

wherein a peak of a concentration profile of said dopant impurity is located in said insulating film.

2. (Original) A method according to claim 1 wherein said insulating film comprises silicon oxide.

3. (Cancelled)

4. (Original) A method according to claim 1 wherein said dopant impurity is boron.

5. (Previously Amended) A method according to claim 1 wherein said crystalline semiconductor film comprises polycrystalline silicon.

6. (Cancelled)

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7. (Original) A method according to claim 4 wherien said boron is supplied by diborane gas.

8. (Original) A method according to claim 1 further comprising a step of removing said insulating film.

9. (Previously Amended) A method according to claim 1 wherein said semiconductor device comprises an active matrix display device having thin-film transistors.

10. (Previously Amended) A method according to claim 1 wherein said semiconductor device comprises a shift register circuit having thin-film transistors.

11. (Original) A method according to claim 1 further comprising a step of irradiating a laser light to said crystalline semiconductor film.

12 - 21 (Withdrawn)

22. (Currently Amended) A method of manufacturing a semiconductor device comprising the steps of:

forming a crystalline semiconductor film on an insulating surface;

forming an insulating film on said crystalline semiconductor film;

introducing a dopant impurity into said crystalline semiconductor film through said insulating film by an ion doping ~~without mass separation~~; ~~and~~

annealing said crystalline semiconductor film~~,~~; and

forming a gate electrode over said insulating film,

wherein a peak of a concentration profile of said dopant impurity is located above said insulating surface.

23. (Original) A method according to claim 22 wherein said insulating film comprises silicon oxide.

24. (Cancelled)

25. (Original) A method according to claim 22 wherein said dopant impurity is boron.

26. (Previously Amended) A method according to claim 22 wherein said crystalline semiconductor film comprises polycrystalline silicon.

27. (Cancelled)

28. (Original) A method according to claim 25 wherein said boron is supplied by diborane gas.

29. (Original) A method according to claim 22 further comprising a step of removing said insulating film.

30. (Previsoulsy Amended) A method according to claim 22 wherein said semiconductor device comprises an active matrix display device having thin-film transistors.

31. (Previously Amended) A method according to claim 22 wherein said semiconductor device comprises a shift register circuit having thin-film transistors.

32. (Original) A method according to claim 22 further comprising a step of irradiating a laser light to said crystalline semiconductor film.

33 - 42 (Withdrawn)

43. (Currently Amended) A method of manufacturing a semiconductor device comprising the steps of:

forming a crystalline semiconductor film having a portion to become a channel region on an insulating surface;

forming an insulating film on said crystalline semiconductor film;

introducing a dopant impurity into at least said portion through said insulating film by an ion doping; ~~and~~

annealing said crystalline semiconductor film~~,~~; and

forming a gate electrode over said portion through said insulating film,

wherein a peak of a concentration profile of said dopant impurity is located in said insulating film.

44. (Previously Amended) A method according to claim 43 wherein said semiconductor device comprises an active matrix display device having thin-film transistors.

45. (Previously Amended) A method according to claim 43 wherein said semiconductor device comprises a shift register circuit having thin-film transistors.

46. (Original) A method according to claim 43 wherein said concentration is within a range from a 5 x 10^{15} atoms/cm^3 to 5 x 10^{17} atoms/cm^3.

47. (Original) A method according to claim 43 further comprising a step of irradiating laser light to said crystalline semiconductor film.

48 - 51 (Withdrawn)

52. (Currently Amended) A method of manufacturing a semiconductor device comprising the steps of:

forming a crystalline semiconductor film having a portion to become a channel region on an insulating surface;

forming an insulating film on said crystalline semiconductor film;

introducing a dopant impurity into at least said portion through said insulating film by an ion doping; ~~and~~

annealing said crystalline semiconductor film~~,~~; and

forming a gate electrode over said portion through said insulating film,

wherein a peak of a concentration profile of said dopant impurity is located above said insulating surface.

53. (Previously Amended) A method according to claim 52 wherein said semiconductor device comprises an active matrix display device having thin-film transistors.

54. (Previously Amended) A method according to claim 52 wherein said semiconductor device comprises a shift register circuit having thin-film transistors.

55. (Original) A method according to claim 52 wherein said concentration is within range from 5 x 10^{15} atoms/cm^3 to 5 x 10^{17} atoms/cm^3.

56. (Previously Amended) A method according to claim 52 further comprising a step of irradiating a laser light to said crystalline semiconductor film.

57 - 60 (Withdrawn)

61. (Previously Added) A method according to claim 1 wherein said annealing step is conducted by a heating.

62. (Previously Added) A method according to claim 22 wherein said annealing step is conducted by a heating.

63. (Previously Added) A method according to claim 43 wherein said annealing step is conducted by a heating.

64. (Previously Added) A method according to claim 52 wherein said annealing step is conducted by a heating.

65. (Currently Amended) A method of manufacturing a semiconductor device having a thin film transistor comprising the steps of:

forming a crystalline semiconductor film on an insulating surface;

forming an insulating film on said crystalline semiconductor film;

introducing a dopant impurity into at least a portion of said crystalline semiconductor film through said insulating film by an ion doping;

removing said insulating film after said introducing step; and

annealing said crystalline semiconductor film after said removing step,

wherein said portion constitutes a channel region of said thin film transistor,

wherein a peak of a concentration profile of said dopant impurity is located in said insulating film.

66. (Previously Added) A method according to claim 65 wherein said insulating film comprises silicon oxide.

67. (Previously Added) A method according to claim 65 wherein said dopant impurity is boron.

68. (Previously Added) A method according to claim 65 wherein said crystalline semiconductor film comprises polycrystalline silicon.

69. (Previously Added) A method according to claim 67 wherein said boron is supplied by diborane gas.

70. (Previously Added) A method according to claim 65 wherein said semiconductor device comprises an active matrix display device having thin-film transistors.

71. (Previously Added) A method according to claim 65 wherein said semiconductor device comprises a shift register circuit having thin-film transistors.

72. (Previously Added) A method according to claim 65 further comprising a step of irradiating a laser light to said crystalline semiconductor film.

73. (Previously Added) A method according to claim 65 wherein said annealing step is conducted by a heating.

74. (Currently Amended) A method of manufacturing a semiconductor device having a thin film transistor comprising the steps of:

forming a crystalline semiconductor film on an insulating surface;

forming an insulating film on said crystalline semiconductor film;

introducing a dopant impurity into at least a portion of said crystalline semiconductor film through said insulating film by an ion doping;

removing said insulating film after said introducing step; and

annealing said crystalline semiconductor film after said removing step,

wherein said portion constitutes a channel region of said thin film transistor,

wherein a peak of a concentration profile of said dopant impurity is located above said insulating surface.

75. (Previously Added) A method according to claim 74 wherein said insulating film comprises silicon oxide.

76. (Previously Added) A method according to claim 74 wherein said dopant impurity is boron.

77. (Previously Added) A method according to claim 74 wherein said crystalline semiconductor film comprises polycrystalline silicon.

78. (Previously Added) A method according to claim 76 wherein said boron is supplied by diborane gas.

79. (Previously Added) A method according to claim 74 wherein said semiconductor device comprises an active matrix display device having thin-film transistors.

80. (Previously Added) A method according to claim 74 wherein said semiconductor device comprises a shift register circuit having thin-film transistors.

81. (Previously Added) A method according to claim 74 further comprising a step of irradiating a laser light to said crystalline semiconductor film.

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82. (Previously Added) A method according to claim 74 wherein said annealing step is conducted by a heating.

83 - 86 (Cancelled)